AN UNUSUAL OUTBREAK OF ANTHRCNOSE IN THE LOWLANDS OF VERACRUZ, MEXICO.

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During the last decade, in the Central America, Caribbean and Mexico, the collaborative research network-PROFRIJOL, has placed increasing emphasis on breeding for resistance to BGMV in addition to improving seed yield. In recent years, reports within this network have indicated that localized out breaks of other diseases such as angular leaf spot, web blight, and common bacterial blight have occurred. These diseases had interfered with the rating of the major disease, BGMV, being studied and thus hampering progress in the breeding program. In this note, we report on a severe outbreak of another disease, anthracnose in the lowlands of Veracruz during the post rainy season of 1999.

In the experimental farm of Isla, Veracruz (50 masl), three hectares of bean trials were planted in October of 1999. Among these trials, four are described in detail: The Uniform Yield and Adaptation Nursery (UYAN) for the tropical humid region of Mexico, the ECAR and VIDAC from PROFRIJOL and a low P adaptation nursery from CIAT. The VIDAC is a preliminary trial that was established without replicates with regularly spaced checks and included 110 genotypes. The UYAN and ECAR included 16, genotypes each, those were tested using a RCBD with three replicates. The low P adaptation nursery was tested as a 7X7 triple lattice design.

During the growing season, unusual wet and mild cool weather enhanced the built up of a severe outbreak of anthracnose, a relatively unimportant disease in the region. In the UYAN, only three genotypes were resistant to the natural infection by anthracnose (<3 in the 1 to 9 scale): UCR 55, TLP 22, and ICTA JU 95-112. No lines from the local breeding program were resistant. In the ECAR only UCR 55 was resistant and in the VIDAC, out of 110 genotypes, only seven lines showed a resistant reaction, <3, on the1to 9 scale (Schoonhoven and Pastor Corrales, 1997). Resistant genotypes included: DOR 649, DOR 644, ICTA JU 95-26, ICTA JU 95-52, ICTA JU 95-94, ICTA JU 95-29 and ICTA JU 95-65. The susceptible reaction of all those genotypes in the VIDAC, from CIAT, and the Guatemalan and Mexican breeding programs suggests a lack of resistance to anthracnose in the bred germplasm of the opaque black seeded class for the tropical region of Central America and Mexico. A similar but less severe outbreak of anthracnose was observed in the same trials planted at the Experiment Station of Cotaxtla, Veracruz.

Included in the low P trial was germplasm from different genetic origins. Resistant genotypes with different seed types were identified in this trial (Table 1). These lines bred at CIAT are not tropical blacks but could be used as sources of resistance to anthracnose. More attention needs to be paid to anthracnose as it can become a very serious problem once established in traditional varieties and farming systems.

Samples of infected pods from local cultivars were sent to Michigan State University for race identification. Race 73 was identified in the infected materials from Isla. Race 73 is the most widespread Mesoamerican race of anthracnose. It is found from Michigan in North America to Argentina (Balardin et al., 1997). Race 73 can be effectively controlled by Andean resistance genes such as *Co-1* and by the Mexican genes *Co-3, Co-4* and *Co-5* including the *Co-6* gene from Central America. In future breeding programs, the resistant genotypes will be inoculated under controlled conditions with the identified race(s). After inoculation, crosses will be designed to incorporate anthracnose resistance into the Mesoamerican race with Andean sources and sources from the highland races of Durango and Jalisco. Other potential resistance sources would be the adapted materials tested and listed in table 1.

In addition to BGMV, bean breeders in the lowlands of Mexico and Central America must focus on the identification of adapted and introduced sources of resistance to potential damaging diseases such as ALS, common bacterial blight, and anthracnose. Sources of resistance must be incorporated into the breeding program and artificial inoculation procedures established to screen for multiple disease resistance. When a trait is neglected in a breeding program, it generally has a tendency to be a greater problem in the future generations.

Table 1. Bean genotypes resistant to the natural infection by anthracnose in the lowlands of Veracruz, Mexico. Winter season 1999/2000

Genotype	Seed Type	Status	Origin
A 195	Large, cream	Bred line	CIAT
A 321	Small, cream	Bred line	CIAT
A 483	Medium, purple,	Bred line	CIAT
MAM 46	Medium, cream	Bred line	CIAT
VAX 2	Small, black	Bred line	CIAT
FEB 190	Small, cream	Bred line	CIAT
FEB 192	Small, cream	Bred line	CIAT
F. de Mayo M38	Medium, pink	Bred cultivar	INIFAP, Mexico
G 8424	Small, purple	Landrace	Guatemala
G 20003	Small, black	Landrace	Ecuador

References:

Balardin, R.S., A.M. Jarosz, and J.D. Kelly. 1997. Virulence and molecular diversity in *Colletotrichum lindemuthianum* from South, Central and North America. Phytopathology 87:1184-1191.

Shoonhoven A.van and M.A. Pastor-Corrales. 1987. Standard system for the evaluation of germplasm. CIAT, Cali Colombia, 56 pp.